

**WHAT IS CLAIMED IS:**

1. A method of data transmission over a network, comprising:  
  
in a first phase during a transmission cycle, sending solely realtime data telegrams over the network;  
  
in a second phase during the transmission cycle, sending at least one of realtime data telegrams and non-realtime data telegrams over the network; and  
  
in a third phase during the transmission cycle, suppressing the transmission of non-realtime data telegrams,  
  
wherein the third phase is followed by a new transmission cycle with a new first phase, during which solely further realtime data telegrams are sent.
2. The method as claimed in Claim 1, wherein the network comprises an Ethernet.
3. The method as claimed in Claim 1, wherein said sending comprises forwarding the data telegrams.
4. The method as claimed in Claim 1, implemented on a switching router, whereby the switching router has at least four transmission priorities.
5. The method as claimed in Claim 1, wherein short filler telegrams are sent in the third phase, and transmission of the short filler telegrams is concluded before the new first phase is started.
6. The method as claimed in Claim 1, further comprising performing a time synchronization of the switching routers.

7. The method as claimed in Claim 6, wherein the time synchronization is performed with a calculation of a delay between two nodes of the network in combination with a synchronization signal.

8. The method as claimed in Claim 1, wherein the network is designed as a line.

9. A switching router for data transmission over a network, having at least four implemented priorities and configured to:

send exclusively realtime data telegrams over the network in a first phase of a transmission cycle in accordance with the priorities;

send at least one of realtime data telegrams and non-realtime data telegrams over the network in a second phase of the transmission cycle in accordance with the priorities; and

suppress the transmission of long non-realtime data telegrams in a third phase of the transmission cycle in accordance with the priorities.

10. The method as claimed in Claim 9, wherein the network comprises an Ethernet.

11. The method as claimed in Claim 9, wherein the sending comprises forwarding the data telegrams.